Responses to information sought under EPA Request for Information, reference APP015649

1 Dilution Ratio

1(a) *- Clarify what Coliban Water mean by "the discharge to the river must not exceed 66.7% of the flow", specifically whether they are referring to flow upstream or downstream of the discharge. Is the intent to request that for a hypothetical 1 ML/day flow rate upstream, up to 2 ML/day of discharge be permitted (i.e. a 1:2 ratio)?*

Response: Apologies if this was not clearly articulated in our amendment application, but the flow monitoring station that will be used to determine the dilution ratio between the release and instream flow is positioned upstream of the release point to the Campaspe River (known as the Kyneton Gauging Station). Therefore, the instream flow would not include any releases from the Kyneton WRP in the calculation, thus avoiding the potential of any double counting.

Therefore, it is correct to state that the intent of the request is that for a hypothetical 1 ML/day flow rate upstream, up to 2 ML/day of discharge be permitted under the amended licence (i.e. a 1:2 ratio).

It is important to note that, from a practical consideration, releases will not be occurring every day (based on historical trends, releases will only occur on about 50% of days in any one year, and primarily between May and September), and, again based on historical trends, that on most days when releases occur, the dilution ratio is most often <10% of instream flow. What Coliban Water is seeking is the flexibility to release up to 66.7% of instream flow, not always release at this level as the treatment process has a discharge flow constraint of approximately 10ML/d, based on the size of the current pump station. Coliban Water has no plans to increase the size of the pump station.

1(b) *- A 1:2 ratio of river water to discharge with no upper limits on the concentration of nutrients and toxicants in the discharge effectively allows for periods of unrestricted discharge and this could result in harm to the Campaspe River. This presents an unacceptable level of risk to the environment, because any upset conditions in the plant will mean only a small buffering capacity in the river and higher likelihood of harm. In a risk assessment sense, the likelihood of an adverse event will be higher, because of the lack of dilution. EPA requests that Coliban Water provide an assessment (using their hydrological model) of discharge scenarios with higher dilution ratios such as with the ratio of river water to discharge being 3:1, 5:1 and 10:1. Please comment on the operational and cost implications of discharging under these scenarios and the adjustments /changes to plant and its operation that will be needed.*

Response: EPA's concerns are noted with respect to no upper limits for nutrients, and those concerns are addressed below in the response to the issues raised in *Section 2 – Discharge Limits*.

It is considered an inaccurate characterisation of the amendment proposal that what has been put forward represents an unrestricted discharge, as in the proposal Coliban Water has committed to releasing only BNR-treated water, whose quality is characterised in the summary document that formed part of the licence amendment application. It is also of relevance that the water that is to be released to the river is equivalent in quality to Class B recycled water, which is used to irrigate parks

and gardens in and around the township of Kyneton. The dilution ratio restricts the volume of discharge, and the treatment process has a discharge flow constraint of approximately 10 ML/day, both which restrict the discharge load.

With respect to the chosen dilution ratio, as was detailed in the response to EPA's RFI dated 13 April 2022:

> *The hydrological modelling indicated that the use of a dilution ratio of up to 66.7% of instream flow, as measured at the Kyneton gauging station, aligned with the other improvement works that had been undertaken at the Kyneton WRP as part of the Kyneton Solutions Project.*
>
> *Applying the principles of reasonably practicable, which are used to support the application of GED, Coliban Water then requested GHD to undertake an environmental risk assessment (ERA) based on this dilution ratio and the discharge of only BNR-treated water to the Campaspe River.*
>
> *The increase in dilution ratio can be safely achieved by Coliban Water's commitment to the discharge of only BNR-treated water to the Campaspe River.*

In putting forward the proposed ratio, Coliban Water is of the view that it has provided sufficient information to demonstrate that the chosen dilution ratio is protective of river health.

Coliban Water is also of the view that the $20 million that has been expended on the Kyneton Solutions Project meets the requirements of reasonably practicable.

It is Coliban Water's understanding of the licence amendment process that Coliban Water puts forward a proposal, EPA assesses the proposal, and then issues a draft licence to Coliban Water for discussion/negotiation. If EPA have a preferred or alternate dilution ratio, then Coliban Water would welcome receiving such advice from EPA. Coliban Water would then provide a cost estimate on the preferred dilution ratio.

2. Discharge limits

2(a) *- The use of rolling medians is an improvement on annual medians but the use of medians without an upper limit is not protective of the environment, very poor effluent quality could be discharged at times but still be compliant with the licence. EPA requests that Coliban Water examine their data and propose either upper limits or 90th percentiles for the discharge parameters or 95th percentiles for microbiological parameters. If a 90th or 95th percentile is to be used instead of a maximum, Coliban Water would need to demonstrate their ability to manage this risk (see Controls to manage risk below).*

Response: It appears that EPA may not have based this review on the most recent version of the Environmental Risk Assessment (ERA). The current version of the ERA is dated May 2022, and was the version that was the basis of public consultation (copy accompanies this document). The parameter table from the public consultation ERA is reproduced below, and includes a 90th percentile value for ammonia and a maximum value for *Escherichia coli* (*E. coli*), which were both amended off the back of EPA's correspondence from April 2022.

Table 1: Proposed water quality parameters

Parameter	Measurement	Licence limit
BOD_5	Rolling Annual Median	5 mg/L
Total Suspended Solids	Rolling Annual Median	10 mg/L
Total Dissolved Solids	Rolling Annual Median	1,000 mg/L
pH	Within the range	pH 6 to 9
Ammonia	Rolling 90th percentile	1.4 mg/L
Total Phosphorus	Rolling Annual Median	0.5 mg/L
Total Nitrogen	Rolling Annual Median	10 mg/L
E. coli	Maximum	400 orgs/100 mL
	Rolling Annual Median	100 orgs/100 mL
Helminths	Maximum	1 *Taenia* egg/L

It is accepted that currently there are no maximum values for total nitrogen, nor total phosphorous and this issue is discussed in the more detail in the response to 2(c).

***2(b)** - The proposed medians are well above the current performance of the plant. EPA requests that Coliban Water revise their proposed medians to be much closer to the current performance.*

Response: The rationale behind the setting of the limits that are included in the licence amendment application is:

- If the limits are set too tight, then issues of licence non-compliance can arise from minor variations in performance, which then poses unnecessary regulatory risk and exposure to enforcement action to Coliban Water for these minor variations, and which is then likely to lead to further capital cost
- If the limits that have been proposed are protective of river health, or are not detrimental to river health, which the ERA indicates that they are not, then the proposal values should be considered as being acceptable
- The limits need to allow for the impacts of projected growth for life of the licence

It is accepted that there is community concern with respect to the proposed values for TN and TP – this is addressed in the next section.

***2(c)** - The upgrade is projected to reduce TN/TP into river, however this is not enforceable by the proposed limits. There is no upper ML/year cap or TN/TP load limit. EPA requests Coliban Water to suggest a cap or load limit.*

Response: As was detailed in Coliban Water's response to EPA's previous RFI, in April 2022, a yearly cap and/or TN/TP load limits are extremely difficult to manage when there is also a dilution ratio included as a licence condition, particularly where the flow in the receiving waterway is highly variable, as is the case with the Campaspe River.

For example, if the flow rate is insufficient to meet the dilution ration requirement to undertake a release of treated water to the river, then this means that water needs to be banked, and relies on future flows being sufficient to allow a discharge to occur. This then run the risk that there may be insufficient days left to discharge within the cap, resulting in a potential compliance risk.

Coliban Water would be happy to discuss the application of either a yearly cap and/or a TN/TP load limit if EPA were open to discussing the removal of a dilution ratio as a licence condition.

The proposed median values were put forward based on:

- The shift from a blended release to a BNR-only release is modelled to deliver:
    - At least a 50% reduction in the annual load of total nitrogen going to the river
    - At least a 95% reduction in the annual load of total phosphorus going to the river
- Further significant reductions in instream total nitrogen and total phosphorous will be achieved by associated Kyneton environmental offsets project

We are confident that the proposed annual median values are protective of river health.

As currently we are only able to model the likely beneficial outcomes of the two dot points above, Coliban Water would be happy to revisit these two licence parameters post licence approval if evidence were to emerge that river health is not being protected.

***2(d)** - The commitment to only discharge BNR-treated water to the Campaspe River is contingent on the completion of the Kyneton Solutions Project, which includes the construction of the irrigation pipeline that is currently in the pre-delivery phase. BNR treated water discharge depends on completion of 'Kyneton Solutions Project'. But no timeline was provided when 'Kyneton Solutions Project' will be completed. The whole assessment is based on discharge of BNR treated water only which is not correct. What will happen until the 'Kyneton Solutions Project' is completed? Please provide a timeline for completion of this project.*

Response: At the date of writing, the pipeline is more than 75% complete. Works have been delayed due to the persistent wet weather that has occurred during construction. The pipeline and irrigation system will be commissioned at some point during the summer of 2022-23.

Coliban Water will require two years of average rainfall to bring the onsite lagoon system into water balance, due to the late start to irrigation season in 2022 and the current high levels of water present in the onsite storages.

3. Key issues missed by the risk assessment

3(a) *- BOD is considered in isolation from dissolved oxygen and risks from low DO% are not well assessed. EPA requests that Coliban Water provide an assessment of the likely impacts of discharging BOD at the proposed limit in low flow conditions in summer at a number of likely discharge ratios.*

Response: It appears that EPA may not have based this review on the most recent version of the Environmental Risk Assessment (ERA). The current version of the ERA is dated May 2022, and was the version that was the basis of public consultation (copy accompanies this document).

Section 6.3.2 of the May 2022 ERA assesses the issue of BOD and dissolved oxygen.

3(b) *- Toxicants other than ammonia are not considered by the risk assessment. There is minimal consideration of metals and other toxicants from AQUEST monitoring in the GHD assessment. Provide an assessment of metal and other potential toxicants and propose limits for toxicants including ammonia.*

Response: As with the response to 3(a) above, it appears that the most recent version of ERA was not used for the review, as the issue of ammonia toxicity was addressed in May 2022 ERA (see section 6.3.1).

Using the broad descriptor "toxicants" is not particularly helpful, as there are hundreds of chemicals that potentially fall under this banner, and it is not feasible to assess the vast array of chemicals that could conceivably be considered as toxicants (as neither do the state's Environmental Reference Standard).

It is important to note that Coliban Water's licence amendment application does not just consist of ERA document prepared by GHD, but all submitted documents, and this includes the AQUEST monitoring reports that look at a wide range of river health indicators.

With respect to other toxicants, multiple lines of evidence for the presence of instream toxicity are presented in the three available AQUEST reports (Attachment B Year 1 Report– page 33; Attachment C Year 2 Report – page 41; Attachment D Year 3 Report– page 45). This work has been undertaken whilst a blended, lesser quality, discharge has been occurring from the Kyneton WRP.

The available results do not show any discernible toxicity at the assessed sites below the discharge point, which leads to the conclusion that the proposed release of only BNR-treated water will not create an unacceptable toxicity risk to the river.

Therefore, Coliban Water has a high degree of confidence that the proposed discharge does not present an unacceptable toxicity risk to the Campaspe River downstream of the discharge point.

Since public consultation was undertaken, AQUEST's Year 4 report has been received by Coliban Water, and it accompanies this submission as further evidence of the toxicant investigations that have been undertaken along this stretch of the Campaspe River.

3(c) *- The discharge is in a Special Drinking Water Supply Catchment Area, so the decision not to assess drinking water (GHD Table 25) as a value is not supported. Provide an assessment of implications to the beneficial use of drinking water.*

Response: The Kyneton WRP sits within the Lake Eppalock Declared Special Water Supply Catchment Area, as gazetted under the state's *Catchment and Land Protection Act 1994* and detailed Schedule 5 of that Act. Coliban Water is not aware of any catchment areas that are designated as a *Special Drinking Water Supply Catchment Area.*

It is true that there are drinking water supplies that are managed by Coliban Water that use Lake Eppalock as a source water. The township of Heathcote draws its source water from Lake Eppalock, and the lake also acts as a supplementary source water for city of Bendigo.

The reasons that GHD did not include or assess risks to drinking water risk are

- The release point for the Kyneton Water Reclamation Plant (WRP) is approximately 50km upstream of Lake Eppalock
- The full supply volume of Lake Eppalock is 304,651 ML, which means a release of up to 10 ML/d from the Kyneton WRP, on around 50% of days per year, to the Campaspe River is negligible in terms of the volume of water in the lake
- The catchment area of Lake Eppalock is fully open, with multiple pollution sources, including on-water recreation, farming activity and numerous onsite wastewater management systems
- Under the *Safe Drinking Water Act 2003*, Coliban Water is obligated to prepare and implement a risk management plan (RMP) for the supply of safe drinking water. The RMPs for the Bendigo and Heathcote WTPs take the quality of the Lake Eppalock source water into consideration

Therefore, the releases do not pose a risk to the supply of safe drinking.

3(d) *- A key risk from a nutrient mixing zone of several kilometres downstream is the development of algal blooms or excess plant growth (macrophytes and Azolla), yet there is no algal or plant monitoring downstream. Is there evidence of past algal blooms or Azolla blooms, for example in Turpins Falls? This is only broadly considered as 'eutrophication' in GHD table 25. This should inform the consequence scores in GHD Table 30. GHD Table 31 and 32 does not consider algal blooms as a risk pathway for primary and secondary contact recreation. The same is true for stock watering in Tables 35 and 36. Update the risk assessment to consider the specific risks from eutrophication related to algal blooms and Azolla growth.*

Response: As is noted in the ERA, there is the potential risk of eutrophication occurring within the modelled mixing zone for TN and TP, which, as a consequence, presents an associated elevated risk of the formation algal blooms, including excess growth of various macrophytes and Azolla. As is noted elsewhere in the ERA, nutrient results for the Campaspe River upstream of the release point from the Kyneton WRP are elevated, and would contribute to the same sorts of risks. As the most likely time for blooms and excess algal growth is during the warmer months of the year (I.e. October to April), a period during which releases from Kyneton WRP are highly unlikely to occur, it was not considered necessary to consider the risk pathway for primary and secondary contact recreation.

Coliban Water has no data or evidence with respect to past algal or Azolla blooms at Turpins Falls.

Over the past four years, the AQUEST monitoring program has been measuring instream macrophyte growth. The reports for Years 1 to 3 have been previously provided to EPA, and the Year 4 Report, which forms part of this response, and, over the past four years, this monitoring program has not detected any excessive macrophyte growth downstream of the release point. It is also important to note that this work has been undertaken whilst a blended, lesser quality, discharge has been occurring from the Kyneton WRP.

Based on the above, Coliban Water believes that the issue of potential eutrophication has been adequately addressed.

4. Controls to manage risk

4(a) *- The low dilution ratio proposed gives rise to high risk during periods of upset conditions. Given the high rainfall infiltration into the plant, the risk of washout events (loss of treatment plant microorganism) remains a foreseeable risk. This risk could be mitigated by considering a higher dilution ratio (potentially with conditional settings i.e. seasonal or minimum flow required), additional treatment, or additional real time plant, upstream and downstream monitoring to inform whether a discharge will cause harm. There are examples where the discharge rate is adjusted based on real time monitoring of key parameters (e.g., Lang Lang WRP and Colac WRP). The risk from the low dilution ratio can be mitigated by improved monitoring. EPA requests that Coliban Water consider real time monitoring systems and a plant management system that allows rapid identification of upset conditions and the river conditions, and that Coliban Water provide a proposed operational monitoring program that could be used to trigger increased frequency of compliance monitoring at different action levels.*

Response: Over the operational life of the BNR plant, Coliban Water has no records of a washout event occurring, even at times of high inflow, as we have the ability to control the flow through the BNR plant, regardless of the inflow to the WRP. Therefore, Coliban Water is of the view that a washout event is a highly unlikely risk for this WRP.

Coliban Water has contacted the water corporations who are responsible for managing the Lang Lang WRP (South East Water) and the Colac WRP (Barwon Water), and neither corporation has instream real-time monitoring in place.

What both water corporations do have, and what Coliban Water also already has in place at the Kyneton WRP, is online process monitoring that alerts operational staff of upset conditions.

More specifically, there are phosphate, nitrate and ammonia analysers at the Kyneton WRP that alert operational staff that upset conditions may be occurring, and which would help mitigate or avoid the release of out-of-specification water to the Campaspe River.

More detail on the process control measures employed at the Kyneton WRP can be provided if required.

As part of the information exchange between South East Water, Barwon Water and Coliban Water on this particular request, the other two water corporations generously shared either their approved, or proposed licence parameters, which are shown in the tables below. Whilst it is appreciated that each licensed release is context specific, and needs to be assessed against that context, it does appear on first glance that what Coliban Water is proposing is not greatly different to what is presented below, especially when neither of these licenses appear to contain a dilution ratio requirement.

Appendix 6: Water discharge table

Discharge Point ID	Discharge Point Name	Indicator	Limit Type	Unit	Discharge Limit
1	Adams Creek	Flow Rate Annual		ML/year	400
1	Adams Creek	Flow Rate Max		ML/day	2.5
1	Adams Creek	Biochemical oxygen demand (5 day)	Annual median	mg/L	10.00
1	Adams Creek	*Escherichia coli*	Annual median	Org/100mL	1000
1	Adams Creek	Suspended Solids	Annual median	mg/L	35.00
1	Adams Creek	pH	Maximum	pH	10
1	Adams Creek	pH	Minimum	pH	6

Table 6 Changes to licence discharge limits

Indicator	Limit Type	Unit	Current Limits	Proposed Limits
Flow rate	Mean daily flow	ML/day	5.7	**7.0**
Ammonia	Annual median	mg/L	2	**1.7**
	95%ile	mg/L		**5**
Biological oxygen demand (5 day)	Annual median	mg/L	5	5
Escherichia coli	Annual median	organisms/ 100 mL	200	200
	95%ile	organisms/ 100 mL		**550**
Suspended solids	Annual median	mg/L	10	10
Total nitrogen	Annual median	mg/L	10	**8.3**
Total phosphorus	Annual median	mg/L	0.5	**0.4**
pH	Maximum	pH	9	9
	Minimum	pH	6	6

4(b) *- Provide an updated communication plan that will keep the community well informed on the status of the discharge including the occurrence and management of upset conditions, the on-going ecological health of the receiving waterway and of changes to the management and treatment of the wastewater and how this may impact water quality.*

Response: Coliban Water already has a number of existing communication channels with the community which it will continue to use under any amended licence for the Kyneton WRP. These are:

- The community has full access to all AQUEST reports that have been undertaken to demonstrate the effectiveness of the Kyneton environmental offsets project, and broader river health issues. The reports are available on the Connect Coliban website (Kyneton Offsets Project | Connect Coliban)
- We are committed to being transparent with our customers and the community when there are interruptions or changes to our services that may impact them directly. We use multiple channels to communicate these messages - including our website, Connect Coliban, social media, on site signage, SMS and email.
- The Connect Coliban website also contains a dedicated webpage on the Kyneton Solutions Project (Kyneton Solutions Project | Connect Coliban)